The CHEMIST

May, 1961

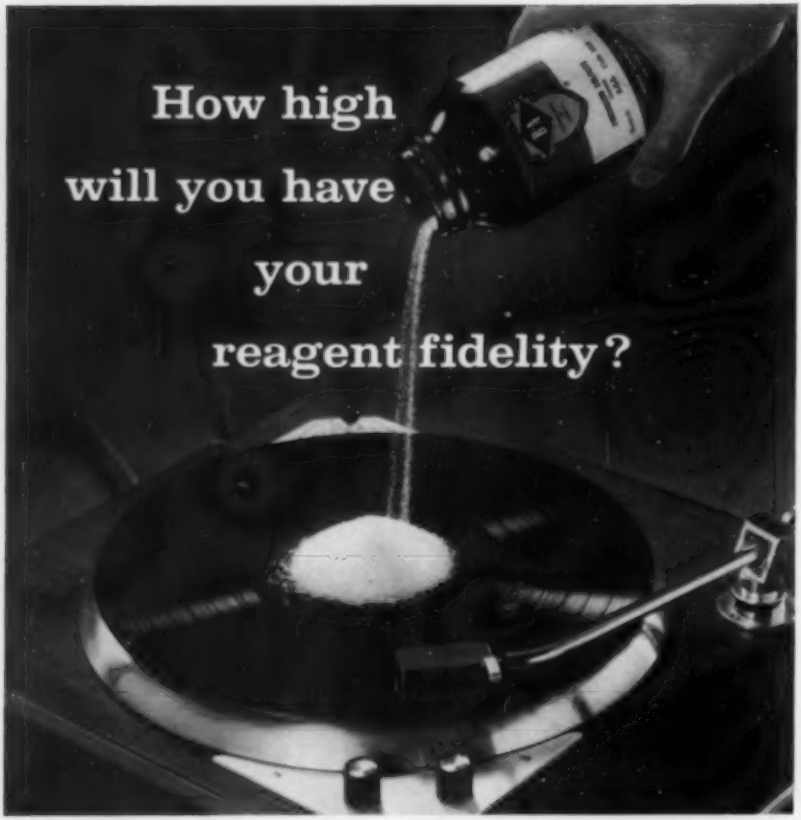
—Minneapolis Morning Tribune

Victor Cohn (left) receiving Honor Scroll of Twin City AIC Chapter from AIC President, Dr. Milton Harris (center). Albert C. Holler (at left rear) chairman Honor Scroll Award Committee, and Dr. Harry L. Weisbecker, chairman of the Chapter, look on.

Volume XXXVIII

AMERICAN INSTITUTE OF CHEMISTS

Number 5



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THE AMERICAN INSTITUTE OF CHEMISTS, INC.

60 East 42nd street, New York 17, N. Y.

Entered as second class matter April 8, 1936 at the Post Office at New York, N. Y., under Act of August 24, 1912. Second class postage paid at New York, N. Y. Issued monthly.

Subscription price, $3.00 a year to Members, $4.00 to Non-Members. Single copy, this issue, $0.35. Copyright, 1961, by THE AMERICAN INSTITUTE OF CHEMISTS, INC.

Vol. XXXVIII May, 1961 Number 5

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Deadlines for THE CHEMIST: For the June issue the deadline is May 15.

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THE AMERICAN INSTITUTE OF CHEMISTS does not necessarily endorse any of the facts or opinions advanced in articles which appear in THE CHEMIST.

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To Come in June

The June issue of THE CHEMIST each year contains as many papers as are available from the Annual Meeting. This year our Annual Meeting, to be held in Washington, D.C., May 11-12, is dedicated to exploring some of the conditions under which chemists and the chemical industry can derive maximum benefit from the Federal Government's support of scientific research and development.

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A Call for Better Communications

(Reprint of an editorial by Larry Resen, Editor, in the February 1961 issue of Chemical Engineering Progress. The need for better communications between chemists and management parallels that between engineers and management.)

"WHAT Others Think of Me" might best be the title of a new report on *Engineering Professionalism in Industry*. It should be "must" reading for every engineer and everyone in technical management, since it asks the same questions of both groups.

The report was sponsored by the Professional Engineers Conference Board for Industry in cooperation with the National Society of Professional Engineers. It is a study in depth made by interviewing 295 engineers and 55 managers in 350 companies. To give balance to the replies, interviews were split among companies maintaining, and constantly raising, high standards of engineering professionalism, and companies "that do not score so high by this criterion," as the report politely puts it.

One of the bright spots of the report is that, in general, both engineers and management are agreed on what needs to be done to advance professionalism. From this point on, there is a wide divergence of opinion, depending on the point of view. In general, the engineers feel the companies are not nearly doing the job on this score that the managers think they are. For instance, on that bread-and-butter item of salary progression, 88% of the engineers and 95% of the managers agree that companies should see that personal income fully reflects the engineers' contribution. But only 23% of the engineers say the companies are now doing it, while 73% of the managers feel it is an established fact.

There is the reverse side of the coin. Engineers and management, 74% and 72% respectively, agree that engineers can help to build professionalism by developing communications skills. However, while 72% of the engineers felt they are doing just this, only 22% of the managers feel they are. There's no doubt that somewhere communications is breaking down. Additional points in the survey bear this out.

While it may be natural to feel not fully appreciated by the boss, it is disconcerting to find that only 41% of the engineers in the better companies ("A") feel that their professional status is recognized to a very high degree, and only 15% feel this way in the "B" companies. At the same time 68% of the managers in the "A" companies feel they do recognize professional status to a high degree while 47% in the "B" companies feel they do too.

Great Expectations

Management might give special heed to the fact that most engineers cite one or more drawbacks to engineering, or ways in which their careers have fallen short of their expectations. This attitude, could conceivably be extrapolated back to the shrinking engineering enrollments in colleges. The principal criticism, 26%, has to do with salary scales. In descending order: 18% complained about mal-utilization; 17% said their work was too routine, specialized and monotonous; 16% complained of no prestige and lack of status; 9% listed loss of identity in a big company as a source of dissatisfaction; 17% had no gripes (total percentage is over 100 due to multiple answers).

The 104-page report is too detailed to do justice to here, but we do suggest it as recommended reading. Meanwhile, its main conclusions are worth reading and rereading. Similar points are advanced in A.I.Ch.E.'s booklet on *Professional Standards*:

1. Engineers can best advance the cause of professionalism by doing the things that make them better qualified engineers.
2. Managers can best advance the cause by seeing to it that engineers' efforts are applied in the best possible work environment, with proper recognition of achievement.
3. Both groups can do much by *improving two-way communications.*

Federal Per Diem Rate for Consultants

The National Society of Professional Engineers, in statements to the House and Senate Appropriations Committees, urged a maximum per diem rate of $100 for experts and consultants temporarily engaged by Federal agencies. Paul H. Robbins, executive director, cited an apparent trend in appropriation measures to reduce the maximum per diem allowance. He said present rates of $50 or $75, which in some instances formerly were $100, are inadequate for the economically feasible performance of consulting engineering services, due to existing high overhead expenses. "The net result of a Federal limitation to less than $100 per day could be that the most qualified engineering firms would refrain from undertaking projects for the Government, leaving the Government's choice to less qualified consultants."

The Instrument Society of America, Pittsburgh 22, Pa., announces that the Second Joint Automatic Control Conference will be held June 28-30, 1961, at the University of Colorado, Boulder, Colo. Sponsoring societies are the AIChE, AIEE, ASME, IRE and ISA.

Special AIC Announcements

Title of Debate Clarified

The subject of the debate scheduled on the Annual Meeting Program for Friday, May 12, at 11:00 a.m., has been reworded slightly for clarification. It now reads: "Should the Federal Government Receive Ownership of the Patents Arising as a Result of Government-financed Research?" The moderator is Dean Arthur E. Burns of George Washington University. The speakers are Senator Russell B. Long, chairman of the Monopoly Subcommittee of the Senate Select Committee on Small Business, and Roger H. Lueck, vice president for research, American Can Company. Discussion will cover what is included or meant in Sec. 3-b of Senate Bill S-1176.

Virginia Chapter Charter Presentation

The Charter will be presented to the new Virginia AIC Chapter by AIC president, Dr. Milton Harris, at a meeting to be held at Reynolds Aluminum Company, Richmond, Va., on May 3, 1961. A panel discussion on "The Chemist's Stake in our Modern Society" will be featured, with Dr. Harris as moderator.

Tenney and Schenberg to be Honored

The New York Chapter announces that it will present two Honor Scrolls this year, honoring Samuel Schenberg, director of science for the Board of Education of the City of New York and Dr. Alvan H. Tenney, manager, Market Research Department, Union Carbide Chemicals Company. Both are recognized for their work in furthering science education in the city schools. The presentations will be made May 25, 1961, at a dinner at the Hotel Shelburne, New York, N. Y.

Current Legislation

Our Committee on Legislation reports that Bills Numbered H.R. 3556 and H.R. 1937 are now pending before Congress. These bills relate to the Federal regulation or supervision of animal experimentation in scientific research. The bills are not desirable legislation and no legitimate public interest will be served by their passage. Dr. Johan Bjorksten, AIC president-elect, and Dr. K. M. Dubowski, chairman of the AIC Committee on Clinical Chemistry, have reviewed these in detail and are strongly of this opinion. We urge our members to consider these bills and if they concur, to write to their Congressmen voicing their objections.

Pittsburgh Chapter Re-elects Officers

The Pittsburgh AIC Chapter has re-elected the following officers:

Chairman, Emerson Venable, 6111 Fifth Ave., Pittsburgh 32, Pa.
Secretary-Treasurer, Dr. Robert W. Freedman, 5028 Debra Drive, Pittsburgh 36, Pa.

Louisiana Chapter Officers

The Louisiana Chapter re-elected, for 1961-62, the officers who served for the preceding year. They are:

Chairman, Mack F. Stansbury, Southern Utilization R & D Division, 1100 Robert E. Lee Blvd., New Orleans 19, La.

Vice-Chairman, Dr. Hans B. Jonassen, 7729 Belfast, New Orleans, La.

Secretary-Treasurer, Lawrence E. Brown, P. O. Box 19687, New Orleans, La.

National Council Representative, Harold A. Levey, 311 Audubon Blvd., New Orleans 15, La.

Midwest Chapter Officers

The Midwest Chapter elected the following officers at its annual business meeting held March 30, 1961:

Chairman, Earl D. Johnson, 2409 West 47th Terrace, Kansas City 3, Kansas.

Vice-Chairman, Raymond H. Frederick, Reynolds Metals Co., 4900 Oak, Kansas City, Missouri.

Secretary, Dr. William C. Pivonka, 7015 Highway No. 9, N.W., Parkville, Mo.

Treasurer, Dr. Robert C. Scott, 9835 Chadwick, Shawnee-Mission, Kansas.

National Council Representative, Henry E. Hancock, 3319 Askew Ave., Kansas City, Mo.

Credit Line

The photograph of Martin Williams on page 179 of the April issue of THE CHEMIST should be credited to James W. Oakley, Jr., *The Centreville Press,* Centreville, Ala.

38th Annual Meeting

Advance registration inquiries indicate that an exceptionally large attendance will mark our 1961 annual meeting in Washington, D.C., May 11-12.

All of Man's Experience

"If you are to live significant lives in the modern world you must learn science; you must learn of its intellectual constructs, of its successes, of its power. You must also learn of its limitations. You must know enough about it, have enough perception about it to distinguish between what I say in my capacity as a scientist and what I say in my capacity as an educated man of good-will.

"But you must do more than this; you cannot expect science to do your thinking for you, to make your decisions for you, to make your life for you . . . Above all, given the world that we live in, in which science plays its remarkable role, you must try to relate the matters about which you must sooner or later make judgments to science in the light of all of man's laboriously acquired experience on the globe."

—Polykarp Kusch, Nobel Laureate
(From *Columbia Research News,* Vol. XI, No. 2)

The American Section of the Societe de Chimie Industrielle, Inc., presented its first International Palladium Medal to Ernest John Solvay, chairman of the Board, National Research Foundation of Belgium, at a dinner held April 20, 1961, at the Waldorf-Astoria, New York, N. Y. Mr. Solvay spoke on the "Chemical Industry in Europe."

The Methodology and Philosophy of Science

Dr. Claude H. Hills

Senior Scientist, Eastern Utilization Research Division,
U. S. Department of Agriculture, Philadelphia 18, Pa.

(A talk presented at the Nov. 3, 1960, meeting of the Philadelphia AIC Chapter, in Philadelphia, Pa.)

SCIENCE is much more than a mass of facts about the universe and an accumulation of material products. The really important contributions of science to our society are a new methodology for arriving at truth, and an improved philosophy about life.

The Scientific Method: Historically man has attempted to gain knowledge about the universe by five methods: Revelation, Authority, Intuition, Logic, and Observation.[1] Science stresses sensory perception (observation) as the best guide to reality and makes use of the other methods only to the extent that their conclusions can be verified by observation and experience.

The Greek method, Scholasticism, based on revelation and Aristotle, assumed that it was dealing directly with reality.[2] Modern science is based on empiricism, the philosophy that valid knowledge about the universe is derived *only* from sensory observation and verifiable experience. It recognizes that we are dealing indirectly with reality. We are dealing with appearances, the impressions we receive through our senses, and the concepts created by our minds. The success of science in recent years indicates that this tentative approach to truth is more fruitful than the previous dogmatic approach.

Briefly the scientific method consists of a sequence of steps beginning with observations about nature and ending with more observations.

OBSERVATIONS
| (induction)
HYPOTHESES
| (deduction)
PREDICTIONS
| (verification)
OBSERVATIONS

All observations are sensory in nature, although scientific instruments are often used to extend the range beyond the power and skill of the five human senses. From specific observations to generalizations or hypotheses involves a process called inductive logic. With each set of observations it is theoretically possible to propose an infinite number of hypotheses, if we include metaphysical ones. In practice, a scientist would consider only those capable of verification, starting with the simplest.

Deductive logic proceeds in the opposite direction, from generalization

to specific consequences. For each hypothesis we can predict that certain cause and effect sequences should follow. Verification consists of further observation to determine which predictions correspond to reality. Where possible this consists of a planned experiment, but in fields such as paleontology, cosmology, or meteorology a planned experiment is not possible and one must rely solely on further observation. Our hypotheses often tell us what to look for and where to look. Then the whole process is repeated over and over. Further observation may cause us to modify or discard our original hypotheses.

Laws of Nature: The broad, basic conclusions of science are called "laws." This term causes confusion because a "law" implies a "law-giver." A "law of nature" is different. It is not an edict that can be obeyed or disobeyed. It is merely an account of events in nature—of the way matter and energy behave. If our account is accurate, there is no possibility of changing the result. The "laws of nature" describe, they do not prescribe.

Historical Development: The history of the scientific method is largely the history of the conflict between the scholastic method of Plato and Aristotle and the empirical method of Galileo, Bacon, and Newton.[2] The Greeks developed a highly speculative science or natural philosophy based on *a priori* assumptions and authority. They had many ingenious theories, including an atomic theory similar to Dalton's. But they had no way of choosing the correct explanation from a multitude of attractive ones. No doubt, Greek success with geometry and deductive logic gave them a false sense of certainty. They failed to realize that a conclusion derived by deductive logic is true only if the premises on which it is based are true. Plato and Aristotle taught that meditation, rather than observation, was the best guide to reality. This combination of speculation and authority, called the Scholastic Method, was later adopted by Christian theologians.

The center of Greek science shifted to Alexandria, Egypt, about 300 B.C. where it flourished for seven centuries. Scholars advanced the fields of mathematics, astronomy, and medicine and even developed the beginnings of an empirical science. However, following Constantine, the newly powerful Church destroyed the University at Alexandria and murdered Hypatia, the leading professor, in 415 A.D.[2,3] The Church could not tolerate the freedom and skepticism of the scientific community. Following this the Western World was engulfed by the Age of Belief and free scientific inquiry was effectively stifled for 1000 years. Only the Jews and Arabs preserved the remnants of science.

The 16th and 17th centuries marked the beginning of the Scientific

Revolution. Around 1600 Galileo developed the experimental method and Francis Bacon popularized it by his writings. It remained for the genius of Newton to perfect the Empirical Method, showing that it is a subtle blend of observation, hypothesis, mathematics, and planned experiment. John Locke extended the empirical method to philosophy and social reform. In his *Essay concerning Human Understanding* (1690), he stressed the belief that all knowledge is ultimately empirical. He stated:

> The hunt for absolute metaphysical knowledge has ended time and again in heroic failure. It is possible that human minds may in time understand ultimate realities. But, if they ever do, it seems more likely to be by scientific perseverence than by any single flight of the imagination.

After Locke, society could no longer ignore the philosophical implications of science.

Philosophical Questions: Science definitely challenges many of our age-old, entrenched views about man and the universe.[4] The underlying purpose of science is to make nature comprehensible, to make it simple rather than mysterious. Science attempts to show that events which seem dissimilar, such as tides, planetary motion, and falling stones are governed by the same material force, namely gravity. Science tends to simplify our knowledge by showing that inanimate and animate materials are governed by the same laws of physics and chemistry. This is the rule of simplicity. As Kemeny[5] states it,

> Why should we believe in a fundamental distinction when we are not forced to? So many fundamental distinctions have turned out to be illusory, as for example the division between matter and energy.

Thus science favors a monistic rather than a dualistic view of the universe. Life appears to be materialistic rather than vitalistic. Animate matter appears to represent merely a "degree of organization" of inanimate matter. The vitalistic view tends to say that animate matter cannot be explained by scientific principles and we should give up the search. Needless to say, science has had considerable success in unravelling the complexities of living organisms using the materialistic approach, and it is not about to give up the search.

Science cannot admit the necessity for a split between mind and matter, body and soul, or matter and spirit. The human mind and personality seem capable of explanation as manifestations of a material body. Thus the average scientist tends to be a monist and a materialist.

Science and Society: All areas of human activity are confronted with competing claims to truth. Those human activities that stress *a priori* claims to truth tend to be rigid, dictatorial, intolerant, and incapable of change. Those areas that rely on "empiricism" tend to be flexible, democratic,

tolerant, willing to experiment, and adaptable to changing conditions. Empiricism fosters political and religious tolerance. It demands the "right to knowledge" and opposes censorship and indoctrination. It insists that our ethics, our morals, and our laws should be based on the results of contemporary human experience, changing as the needs of society change and as we acquire new knowledge.

History shows that the enforcement of *a priori* metaphysical beliefs has interfered with the scientific search for truth and caused much human misery. This problem is still with us. Today, in an enlightened Age of Science, metaphysical concepts seriously hamper man's efforts to solve the problems of overpopulation, mass starvation, and disease.

Society is indeed indebted to science for providing an improved methodology and a new philosophy. The empirical method is an effective, self-correcting procedure for arriving at truth and applicable to all areas of human endeavor. Science has also changed man's outlook on the world. The unknown is no longer something to be feared and avoided, but instead is a challenge to man's powers of intellect. And finally, science fosters humanism—a deep concern for the welfare of mankind and the belief that man can and must assume responsibility for his own future.

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3. Encyclopedia Britannica, Vol. 12, p. 20, article on Hypatia.
4. Rafton, H. What Can We Believe? Am. Humanist Assoc., Yellow Springs, Ohio.
5. Kemeny, John. A Philosopher Looks at Science. D. Van Nostrand, New York, 1959.

Raymond S. Dalter, F.A.I.C., formerly with Spencer Chemical Co., Merriam, Kansas, is now with Carlisle Chemical Works, Inc., Reading, Ohio.

Malcolm G. Bourne, Jr., M.A.I.C., has joined AviSun Corporation, Post Road, Marcus Hook, Pa., in the market research department.

Dr. Clarence H. Buurman, F.A.I.C., has been named to the position of production manager, Linden Dyestuff Plant of General Dyestuff Co., Division of General Aniline & Film Corp.

Richard L. Moore, F.A.I.C., has been named director of public relations for W. R. Grace & Co., New York, N. Y.

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Patent Ownership

Big Government vs. Small Business

Dr. Donald B. Keyes, F.A.I.C.
480 Park Ave., New York 22, N. Y.

IT is claimed (*Chemical & Engineering News,* Mar. 13, 1961) that there is a fight going on between "Big Government" and "Big Business" to determine which party to a government research contract should own the patents which may result. This statement is in error. It is not "Big Business" but "Small Business" which is involved. "Big Business" can afford to take temporary losses when they feel that they can acquire greater profits in the future by doing so. "Small Business" can not.

A review of the facts may be of interest to those who really would like to learn these facts. Here they are:

(1) If anyone, including the Government, has paid the *actual* cost of a research contract he is entitled to the ownership of the resulting patents, if he so chooses.

(2) The only financial value of a patent is the privilege it gives its owner to require payment for the right to use the invention covered by it. The courts uphold this right.

(3) When the Federal Government owns a patent it has usually been assumed that we, the citizens, own the patent and therefore we all are entitled to make use of the patented invention without payment of any kind. From the layman's standpoint the patent becomes merely a published article and of no greater value.

To support this assumption it should be noted that at no time in history (as far as I know) has the Government charged a royalty or sued an infringer of a patent owned by it even though the Government is reported to own more patents than any individual or any other organization in this country.

(4) The primary purpose of a Government research contract is to solve a problem whose solution will be of real benefit to all of us and to do it as quickly as possible. In order to do this we must employ on these contracts our best minds, not just "warm bodies."

(5) All men, even the best, must have a real incentive to work hard. In industry neither the individual nor the organization will put forth their best efforts without a financial incentive. Small organizations must have continued profits to exist.

(6) Our patent system is the finest in the world and upon this

incentive system (and not the "Welfare State") was built the world's greatest industrial nation—the U.S.A.

Many years ago this country had a president who had a similar basic philosophy. I quote:

> You cannot strengthen the weak by weakening the strong.
>
> You cannot build character and courage by taking away man's initiative and independence.
>
> You cannot help men permanently by doing for them what they could and should do for themselves.

Strange to say he was both a Liberal and a Republican, but Mr. Lincoln was murdered because of his ideas. Today he probably would be only jailed as a crack-pot—such is "Progress."

Russian Launching of Astronaut Evaluated

Prof. Lloyd Motz of the Department of Astronomy of Columbia University, speaking at a meeting of the new Connecticut AIC Chapter in Springdale, Conn., April 13, said that it would be dangerous self-deception to underestimate the importance of the Russian's successful launching of a man in space, followed by his safe return. He spoke at the AMF laboratories on Hope Street.

Prof. Motz stated, "The launching into space, by the Russians, of the first astronaut must be counted as the greatest technological breakthrough in the history of mankind. Until this event occurred, we could not be sure that man could ever leave this planet, but now the avenue to outer space lies open to us.

"Not only has it been demonstrated that man can survive a trip through the unknown hazards of space, but it has also been demonstrated that he can retain all of his mental and physical faculties during the trip and perform the necessary technological operations that will be required in guiding the vehicle and carrying out complex experiments and observations. This is of incalculable significance. This achievement stands to the launching of the first Sputnik as the latter stands to the launching of the first airplane."

Dr. John L. Wilson, F.A.I.C., has been elected senior vice president of Economics Laboratory, Inc., St. Paul, Minn.

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Time to Stick Our Necks Out

(Excerpts from the remarks of John W. Campbell, Jr., presented to the Research Committee of the NAM, Oct. 9, 1959.)

IT is a great thing to have the courage to stick your neck well out and say, "This is what I mean; I mean exactly this; I think that this is right." This is stated in such terms that, if you are wrong, you can be shown you are wrong. In the physical sciences there is the right to be wrong.

But that right seems to be degenerating. For every right there is a duty. For every duty there is a right. But if we have the right to be wrong then we've got the duty of being wrong. If you have the right to stick your neck out, you have the duty to stick your neck out. But at the present time in our culture we have reached a point where research is not sticking its neck out. The right to be wrong is being greatly reduced. And the more the right to be wrong is reduced, the less effective, the less progressive, our research will be.

I was interested in a discussion concerning Department of Defense contracts. In essence, under such contracts, you are required to state what it is you are about to discover, how you are going to go about discovering it and how long it will take you. Now, if you can make these statements, it ain't discovery, Bud! You cannot possibly do any real research, any real scientific, fundamental, research under that sort of contract . . .

One of the things that was outstanding several centuries ago was the patronage system under which research was carried out. Somebody with a title and an adequate income would supply the money for some would-be scientist to do research. Tycho Brahe was supported by a nobleman. Gauss got his education through the patronage of a local duke. This is a good system. It has a great advantage that, so far as the patron is concerned, this research is a hobby. Even if he gets nowhere, he has the fun of supporting his hobby.

This patronage system had another advantage in that it permitted support of utterly impractical research. The closest approach to this in recent years was the utterly impractical research started by Bell Telephone Laboratories immediately after the war. They deliberately looked around for a field of research in which nothing useful was known. I think their basic thought was that if you found a field where absolutely nothing was known, it was almost certain that there is something to be discovered. Well, they decided that of all available fields that they could find there was least known in solid state physics.

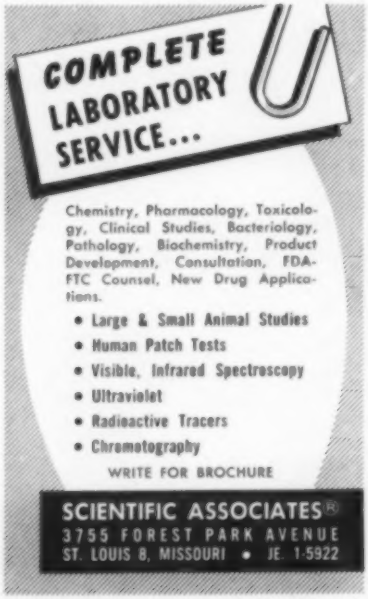
I understand their original plan was to invest about 10 million dollars

in setting up a laboratory; they expected to invest about 5 million dollars a year for at least ten years, with no return. You all know what happened. In two years they had the transistor. This was a complete surprise . . .

The right to be wrong is an important thing that is being neglected. It's the right to do impractical research. It's the right to try something that you think is wrong, because it *might* be right . . .

I suggest that it is time for us to stick our necks out. The Russians have been sticking their necks out very successfully. They've stuck their necks out beyond the moon now. Time we did a little more of "sticking of the neck out." You may have seen the little cartoon during the war saying "Behold the Tortoise, Who Maketh No Progress Unless he Stick-eth Out His Neck." We're in the position of the tortoise; we make no progress unless we "sticketh out our neck."

Gilbert J. Straub, F.A.I.C., is now with Lakeside Laboratories, 1707 East North Ave., Milwaukee, Wis.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Dr. Alfred E. Brown, F.A.I.C., has been elected president of Harris Research Laboratories, Inc., 6220 Kansas Ave., N.E., Washington 11, D.C., an independent subsidiary of The Gillette Company. He remains director of research of the company, which he joined in 1945.

Dr. Lloyd Van Doren, Hon. AIC, represented President Milton J. Eisenhower and The Johns Hopkins University during the recent inauguration of Dr. G. Homer Durham as president of Arizona State University at Tempe, Arizona.

Dr. Milton J. Allen, F.A.I.C., has joined the staff of Electro-Optical Systems, Inc., 125 N. Vinedo Ave., Pasadena, Calif., as manager of the Chemical Research Department. He was formerly director of the Physical Research Labs. of Ciba Pharmaceutical Products.

The Exciting World of Tomorrow

Victor Cohn
Science Writer, The Minneapolis Tribune, Minneapolis, Minn.

(Condensation of an address presented when the author received the Honor Scroll of the Twin City AIC Chapter, Jan. 31, 1961, Minneapolis, Minn.)

I AM writing a series of newspaper articles to be called, "1970: Your Fantastic Future." Our purpose is not to give an accurate forecast, which is impossible, but to get people thinking about some of the implications of things going on in many fields. The next decade, to some a decade to fear, may instead be the most thrilling in history. Man will for the first time climb far above his earth's atmosphere. He should learn to pre-determine his children's sex, translate languages by machine, and keep an animal (perhaps a human) alive with an artificial, plastic heart. Science will produce more surprises than it produced in the '50's, for the army of scientists has doubled and these men are exploring many exciting things.

The 1960's will be an automatic and electronic age with shorter work hours for many and greater opportunities, if men can be wise, for more fruitful lives. The transition to an automatic age, an age of knowledge and specialization, is occurring so rapidly that in the Los Angeles area there are 170,000 unemployed while Los Angeles firms are advertising in the New York newspapers for skilled workers . . . Housewives may heat, clean, cool and cook electronically in 1970, in 10 minutes, by dialing the day's directions into a home electronic brain. New homes are going to be made of colored plastics, light metals, and poured concrete in bold new shapes: shells, arches, graceful free curves, flowing domes. Even the carpet may be plastic, sprayed on. Many say our homes will change more in the next 10 years than any other area of our technology.

The automobile of 1970 is starting to take shape, as well as a second-generation jet airliner to cross the Continent or the Atlantic in an hour and 15 minutes. In aircars, sky-jeeps and great low-cost airliners, men of all nations will begin to make today's world travelers look like stay-at-homes. And the new contacts and population shifts are going to deeply change relations between nations. Scientists will begin to engineer the world's sunshine and weather, the atmosphere and the oceans, and pull resources from the air and oceans to feed the world's new millions. Scientific thinkers today are taking a new geo-engineering approach to many of the world's energy and resource and power and food problems . . .

We have begun the exciting search for life on other planets. What will we find? Something like human life or something "scant and small,

pinched and meager?" Or something "far surpassing our own forms, making men, bees and crows seem ridiculously primitive?" One day a scientist may point to something he has created in a test-tube and say, "This is life." We will then have on our hands a new problem and challenge as great as our knowledge of the atom. About Dec. 1, 1970, we may run a news story as follows:

"A surgeon said he had successfully transplanted a human heart from an auto-crash victim to a patient whose heart had been failing." . . . We will also see a broad, new medical attack against aging, including some serious studies by doctors who say, "theoretically there is no reason why many men cannot live to be 100." . . .

All of these things will better our standard of living. So the age of science is certainly one that pays off for us. Or does it? Is material progress really wonderful? Does it mean good? Dr. Louis B. Wright, director of the Folger Shakespeare Library in Washington, said this about our material civilization:

> If any relics of our existence can be found 1000 years hence, some archeologist or anthropologist may refer to it as the American tail-fin culture. In these years we reached the ultimate in vulgarity when our engineers lavished their best efforts on the backsides of motor cars and the high priests of Madison Avenue drenched the airways with smooth and honeyed banalities. Americans have been trained to regard the highbrow as an undesirable citizen unfit for the society of good fellows. We have caricatured the professor, we have paid teachers less than day laborers, we have not proved ourselves very bright and we shall have a hard struggle to survive. There is some doubt whether we deserve to survive.

This is not unfamiliar criticism. *The Man in the Gray Flannel Suit, The Organization Man, The Lonely Crowd, The Power Elite,* all give us a picture of a rather thinly democratic, uncertain, largely unhappy America in which all of us are engaged in a terrible rat race and nursing our ulcers. I quote this because there is truth and sting in it. Yet I believe just the opposite of Dr. Wright's conclusion. What is to be the future of man in our world of the future? Are we to become robots, miserable test tube members of an inhuman, brain-molding society, as many thinkers fear? Or will we remain man, laughing, weeping, free to make heroes or fools of ourselves as we please . . . I compared the kind of lives the people on my street live now, and what they do with their time, with the life my grandfather lived and the kind of work he did. I decided we have it better. Were my grandparents here today they wouldn't want to go back.

Man's world is always perilous. But we are justified in some optimism based on trends we can now see. The automatic era can give us

more income, more leisure, more time to think—some will actually use it to think. Our electronic computers and power tools, far from degrading us, give us a decided edge in the battle of man versus robot. True, the danger of becoming dehumanized exists. The responsibility is ours for keeping and deepening our moral values, for preserving individual freedom and dignity, for using technology. Science and technology do not give us freedom, we have to work for these as always.

But the hopeful thing is that if we look at life in America and take into account the worst of it—jobless, delinquents, whatever you will—there are also many encouraging trends. The studies of automation show that machines have not so much mechanized workers as released them from monotonous and tiring jobs. They have given us our short working day and our leisure. They are fast making peasantry and unskilled agricultural labor obsolete. The automobile carried us to see over our horizon . . . The textile industry freed women from spinning wheels and gave them time to be clubwomen and politicians, and they like it . . . Americans are spending more money today on concerts than on baseball games and twice as much for books as they did 10 years ago. Piano is booming, classical records are booming, American symphony orchestras have increased in number from 10 in 1900 to more than 1000 today . . . A hundred years ago it was not unusual to let a beggar lie in a gutter unnoticed. Today our treatment of the unfortunate is becoming less brutal and more humane. In 1900 the necessities of living permitted few boys and girls to go beyond a few hand skills and bare reading and writing. Today mass education is the rule, and every 10 years half again as many Americans are graduating from college.

Americans are notable for luncheon clubs, but also for spontaneous community responsibility. No place else does a March of Dimes, a people's movement, finance the development of a polio vaccine. Our participation in self-government at the neighborhood level has never been more widespread. Unions have helped give workers status and strength. Industry, until recent years, had not been much aware of the human element, but today health programs, retirement plans, recreation schemes, flourish. For the first time more Americans own their homes than pay rent.

Charles Eames, who designs the modern chairs and is also a thinker, said to me:

> The fact is the direction today is to the whole man, the whole man as DaVinci thought of himself, the working man, thinking, creating, playing, growing, participating in democracy, not wholly given over to his labor

> or profit, yet laboring and profiting to get the world's work done. For while we live in a dangerously complicated society where we must handle and analyze many complicated factors which might enmesh us, we have or rapidly are getting automatic equipment to take over, and it is where things are most difficult that we will get more equipment freeing us.

Automation in this view should slow down our pace of life. It should free us from routine to create. TV and the blossoming of the basement den and the rebirth of the porch and the yard with barbeque and swings—these have started remaking the home as a recreation center for all ages. Today's family, gardening, swimming, skating, model-building together, is setting a new pattern that has hardly begun to be described by the sociologists.

Television endangers us by wooing us from reading and thought and not giving us enough solid fare. And yet TV is having its most intense impact not as an educational medium but as a political medium. You can now see political conventions in the home, and this adds great meaning to the words you then read in the newspaper. This has a tremendous effect . . . One hears about the horrible spectacle of the modern masses reading mass comic strips, looking at mass TV programs, and thinking mass thoughts fed them by someone else. But few of mass communications' critics have taken into account the fact that in the two large countries most technologically advanced, the U. S. and Britain, we have been most successful among the large-population countries in practicing democracy.

One hears about the race between science and man's ability to control it. The description is inexact. The race is between man's ability to do good and to do evil, and it began when man first appeared. In this age when barbarism is so much with us, we forget how far man has come from universal barbarism, and we forget how few men in any past age have been the educated and responsible. Mass education, the vote, civil liberties, social responsibility for the unfortunate, are all relatively new concepts in the light of history, and it is not surprising that they still have not reached much of the world . . .

All this is patting ourselves on the back. What's the point? There is some point, because we are going to have a struggle between man and robot. It is important to decide what things are in our favor, what values we want, because unless we know, we can lose. Reject change and we will be enslaved by it. A difficult struggle is man's typical state. Accept change and we may control it. We need the voices of critics, but we also need to see the more hopeful vision ahead. We certainly

need to see it as we face the world, for our relations with the rest of the world are the commanding fact of our time.

Beyond all our faults, there is one large fact in our favor: We are a free people. Travel a little and you suddenly realize as you look at tyrannies and dictatorships that democracy is a precarious thing. Knowing all these things is important when people ask: Why all the progress? Why new discoveries? Why science? Why not slow down? What are we hurrying for?

We are hurrying because America's next 10 years will bring 30,000,000 new Americans who need homes, jobs and transportation. The world's population will go from 2.9 to 3.5 billion. China alone will add from 12 to 20 million people each year. The whole world sorely needs new methods, new speed, new food, just to breathe and move and offer hope instead of bitterness to these new millions.

Science cannot save us, but we cannot be saved without science. And we of the free world will need sharp and growing science to remain strong, so we can turn the competition with the increasingly-brainy Communist world into some kind of peaceful cooperation . . . In St. Paul, Oct. 17, 1957, 13 days after the first Sputnik, Prof. Edgar Piret, chemical engineer at the University of Minnesota, just back from Russia, talked to a group of chemical engineers. He told them of the army of graduate students in Soviet chemical engineering, and how all but a few Russian chemists and physicists enter graduate work at good state pay and state expense, whereas our students go out in industry, and can't afford to come back. "Of course," said Piret, "We have several research fellowships open. We can pay you $1453 for 9 months, in case you are interested." And many laughed. Today it costs $50,000 to $100,000, to train a Ph.D. in any one of several important fields. To keep our country strong, we're simply going to have to help pay for this.

We do not yet know the limits of human intellectual power, which only recently began to apply itself to man's problems. Bertrand Russell wrote:

> "Man has existed for about a million years. He has possessed writing for about 6000, agriculture somewhat longer. Science as a dominant factor in determining the beliefs of educated man has existed for about 300, as a source of economic techniques for about 150. When we consider how recently it has risen to power, we find ourselves forced to believe that we are at the very beginning of its work in transforming society."

Julian Huxley, no easy optimist, says,

> The most important new fact of the past half century is, I believe, that the human species has for the first time in its history begun to take stock of its position in the world.

William Faulkner, in his speech accepting the Nobel prize, said, "Man will not merely endure, he will prevail." On a television program on American rocket and missile developments, Dr. Hibbs, chief research analyst at Cal Tech's Jet Propulsion laboratory, was asked, "What is the final test of a missile?" He answered, "The final test is continued peace. If any of these missile systems has to be used in war, the whole program is a tragic failure."

If we can sacrifice and build in this country, and build fast, and all of us maintain the morality of this scientist, we may be given to prevail.

(For the citation to Mr. Kohn, see page 184)

The New Egghead

Daryle Feldmeir
Managing Editor, Minneapolis Tribune, Minneapolis, Minn.

(Excerpts from a talk presented when Victor Cohn received the Honor Scroll of the Twin City AIC Chapter, Jan. 31, 1961, in Minneapolis, Minn.)

FIVE years ago I came to the gnawing realization that I was intellectually unprepared to edit a newspaper in a day when almost every news cycle brought some new story involving fission or fusion or thermonuclear reaction or any of a vast multitude of scientific terms. I had before me, brooding over it, another one of those stories. This was by one of my finest reporters. It concerned high-altitude balloon flights in search of scientific data.

As I mulled over my personal inadequacies to understand this story, I thought about our general constituent, our reader, the man in the street, the newspaperman's constant testing symbol, the milkman in Omaha. I wondered what he would understand from that news story. It is a comforting life to be an editor. I can always hide my own ignorance behind the supposed ignorance of the reader. So I bounced across the room to the desk of the reporter who wrote that story, and I said, "Look, there is no point in writing esoteric stories about atomic development unless you can write them in terms that an idiot can understand. Write a story sometime that would show a person like me how atomic power really affects my every-day life. That's the kind of story our readers can understand."

The reporter suffered my lecture. And a day later there was on my desk another atomic story. It dealt with chickens that eat eggs from the nest. It seems that there is an administrative officer at the University of Minnesota who farms part time in a casual, gentlemanly sort of way. He had been having a problem with some of the chickens eating eggs from the

nest. A physicist colleague said to him, "I think we can help you with your problem. Bring a couple of eggs to work with you tomorrow." So the man brought the eggs to the physicist. The physicist radioactivated the eggs and put them into the nest that night. The next morning they ran all the chickens past a Geiger counter. They found the two that were radioactive and cut off their heads. He has never since been bothered with the problem of chickens eating eggs.

It was a simple story. Even I could understand it. In fact, I understood not just the surface story. Those words made a point. I suddenly realized that the world had changed. That the scientific mind was at last in the saddle and that those of us who were trained in the less exact sciences of history and literature were simply suffered to exist. We dwelt on the periphery of the scientists' world. But the world was theirs, and not ours. I knew then that if the egghead ever regained top-drawer status in our society again, it would never be the egghead that I knew—the literary egghead. It would be the scientific egghead.

There is a new egghead and all of us, taxpayers and free-loaders alike, worship at his shrine. I do not envy the new egghead. I sensed that after the first blush of power and prestige had vanished, the new scientific egghead was going to discover that he was in the boat with his predecessor, for it is the nature of our world that no body of men, however erudite, is suffered to wield much power without being subjected to the illiterate questioning mind of the rest of us. And at such a moment this ruling force is constrained to unfold its mysteries to the general public. The day already has arrived for you.

You have been called forth from your laboratories to make your case before the unknowing masses. If we must follow your lead, then let's hear the alternatives and then, but only then, will we choose. Are we behind or are we ahead? Are we spending enough or too much? Should we continue to test or not to test? These are the questions.

It is the rare good fortune of this scientific egghead that he should come to the full flower of his status at a time when our newspaper profession, too, has reached new levels of professional excellence. There is a new breed of reporter and editor abroad today. They are college trained, many with graduate degrees. They are specialized and learned. They are hired after exhaustive ... teries of tests—prepared by the scientific egghead, of course. They are given the Minnesota Multiphasic, the Michigan Vocabulary, the Ohio General Interest, and a couple of Rorschach tests ...

It has been the good fortune of the new scientific egghead that at the

very moment when it has become absolutely vital that he explain his work and his function to the general body politic, there has emerged this new newspaperman. One of the most valuable members any editor can have on his staff is the reporter who is competent to understand and explain the new scientific egghead.

Unquestionably, Victor Cohn stands with a select few in the ranks of the top science reporters in America today. For his work covering science and medicine, *The New York Times* has called Victor Cohn "one of the best science reporters in the country." And he is. Honors are not new to Victor. He has twice been awarded the Westinghouse prize of the American Association for the Advancement of Science for the most distinguished newspaper science reporting of 1951 and again of 1959, the first to twice win that award. He has three times won the Distinguished Service Award of Sigma Delta Chi, the journalists' own fraternity, for the best general newspaper reporting of 1952, 1956, and 1959, the only time this prize has been won more than once by any reporter. He won the 1958 Albert M. Lasker award for medical journalism.

He has written about space, the stars, the new scientific weapons, parents' problems, juvenile delinquency, the attack against cancer, heart disease and polio; he has reported the story of socialized medicine from Great Britain, the story of polio and Sister Kenny, from Australia, the story of the atom, from a half-dozen points around the world; the story of the Soviet bid to overtake us in science, from Russian centers of physical science. And he has twice covered the Atomic Energy Congresses for us at Geneva, Switzerland.

Victor's articles have been syndicated in the *Philadelphia Bulletin, Detroit Free Press, St. Louis Post Dispatch, Chicago Daily News,* and many others. He is the author of a 1956 book, *1999: Our Hopeful Future.*

Victor was born in Minneapolis and was graduated from the University of Minnesota with honors in journalism, political science and history. He was the editor of the *Minnesota Daily,* the University newspaper, in 1940-41. He served in the Navy (1942-45) as an enlisted man and then as a communications and signal officer with the rank of lieutenant.

These are his credentials of his profession. He combines the best of my profession and yours—the inquiring mind, the restless searching soul, the never-satisfied seeker after the facts. To these qualities, he adds the distinction of being able to string words together in such a fashion that men will stop to heed them, to understand them in their clarity and in their accuracy. He is the epitome of the jet-age journalist.

For Scientific Breakthroughs, We Must Go Beyond Restraints

Dr. Johan Bjorksten, F.A.I.C.
Bjorksten Research Foundation, Houston, Texas

WHERE large sums are dispensed for research, selection of a basis for judging applications becomes of the utmost importance. Dr. Ernest M. Allen, Chief, Division of Research Grants, is certainly to be commended for publishing these criteria, as applied by the National Institutes of Health, in *Science,* Nov. 25, 1960 (reprinted in THE CHEMIST, Feb. 1961.)

Obviously these criteria will be effective in eliminating ill-considered, thoroughly weak applications. But how would the strong, unconventional approach fare, the application in support of research that breaks away from precedents to blaze new paths?

To answer this question, let us examine how some of the research projects of the past, today considered milestones of medical progress, would have fared had they been submitted to an NIH of their time and judged by the accepted authorities of their day, organized as study committees, and using the criteria published by Dr. Allen:

Claudius Galenus of Pergamus (130-200) had many a controversy with his colleagues during his lifetime, but his teachings were to have a profound influence for over 900 years. Galenus was an enthusiast, impatient with his less progressive colleagues—he scored unmercifully in his writings the methodists, dogmatists, pneumaticists and empirics then dominating the medical field in Rome. If Galenus had asked for a research grant to elaborate on his finding that "blood, not spirits, is contained in the arteries," or to use humans instead of monkeys in his studies of anatomy, he would have faced an unfriendly study committee. The pneumaticists, and the followers of Erasistratus among its members would surely have caused a rejection of Galenus' applications on Dr. Allen's Shortcomings 1 and 22:

> "The problem is of insufficient importance or is unlikely to produce any new or useful information," and "The investigator needs more liaison with colleagues in this field or in collateral fields."

Let us now skip the dark ages, when little progress was made, and come to Vesalius (1514-64), father of modern anatomy. Vesalius made dissections on humans, discovered that the classical savants had done their

work with monkeys and were critically inaccurate. When at the age of 29 he published his *De Humani Corporis Fabrica,* and showed 200 errors in the classics, the repercussions were terrible for him, and he was forced to leave the University of Padua. Suppose he had applied to an NIH of his day for aid to study anatomy by dissection of humans, how would he have fared? The Study Committee would have been composed of men imbued with reverence for the classics—their idea of solving a problem was to search the writings of old authorities. Vesalius would surely have been rejected on the basis of Dr. Allen's criterion 18:

> "The investigator appears to be unfamiliar with recent pertinent literature or methods or both."

Next in line with his application is Santorius (1561-1636), professor at the well-regarded University of Padua. He was the first to measure body temperature, more than a century before G. Martine and C. R. A. Wunderlich. He observed changes in body weight and discovered that the insensible perspiration exceeds all other bodily excretions combined. Let us suppose he asked his NIH for support of the work on temperature measurements in disease. He would have been turned down on Shortcoming No. 19, for his thermometry was indeed somewhat substandard even in the light of what was then known in the field of physics:

> "The investigator's previously published work in this field does not inspire confidence."

Next we come to William Harvey, whose brilliant and extended studies led to the understanding of blood circulation. His application to NIH for a grant to explore this subject would no doubt have been rejected on Shortcoming 3:

> "The problem is more complex than the investigator appears to realize."

G. A. Borelli, the first biophysicist, explained the movements of the body on mechanical principles. He had good ability to present his ideas, but was perhaps for this very reason unpopular with his colleagues. In 1674 he was forced to leave Messena. Suppose that he had at that time applied to the NIH for a grant for the studies which led to his main work, *De Motu Animalium,* published in 1680. He would, no doubt, have been turned down on Shortcomings 17 and 25:

> "The investigator (a mathematician) does not have adequate experience or training or both for this research," and "The institutional setting is unfavorable,"

for he then had no academic connection and lived in Rome on a private subsidy from the abdicated former queen of Sweden.

Prior to Albert von Haller it was believed that the nerves were tubes,

which pumped "nerve fluid" into the muscles, causing them to bulge and contract. In a series of brilliant studies, von Haller disproved this, and introduced the concept of irritability and nerve response to stimuli, which still holds (*Elements of the Physiology of the Human Body,* 1759-66). If von Haller had applied to NIH for support of his ambitious studies of nerve physiology, he would doubtless have been turned down flatly on Shortcoming 3 or 21:

> "The problem is more complex than the investigator appears to realize," or "The investigator is spreading himself too thin, he will be more productive if he concentrates on fewer projects,"

for von Haller was ranging far and wide between poetry and plant physiology.

Rev. Stephen Hales (1677-1761) was the first person to measure blood pressure and the velocity of blood. If he had applied to an NIH for support of this work, prior to the publication of his *Haemostaticks* in 1733, he would have been refused on the grounds of Shortcomings 17 and 25:

> "The investigator does not have adequate experience or training or both for this research," and "the institutional setting is unfavorable."

These grounds would also have applied to William Beaumont, Vermont army surgeon, who never went to a University. Beaumont greatly enhanced our knowledge of gastric secretions by work with a single subject, a young fur trader who had a permanent opening in his stomach as a result of an accident with a musket. This made it possible to directly observe and sample his stomach secretions. Any support for Beaumont's pioneering studies on gastric function would have been additionally precluded by Shortcomings 13 and 15:

> "Controls are either inadequately conceived or inadequately described," and (for indeed Beaumont had only one subject to study) "The number of observations is unsuitable."

Luigi Galvani discovered the electric battery action in 1771. Twenty years later he published a paper on the effect of electricity in causing neural reactions. This time interval would have been greatly shortened by a suitable grant, but a NIH of his time no doubt would have rejected his application for support on Shortcomings 3 and 5:

> "The problem is more complex than the investigator appears to realize," and "The problem is scientifically premature and warrants, at most, only a pilot study."

A. L. Lavoisier, by introducing precise weighing as a key method in chemistry, solved the problem of the nature of combustion, and disproved the then accepted "phlogiston" theory, which assumed that the combustible

substances contained "phlogiston," an assumed substance of sometimes negative weight and other most elusive properties. Had Lavoisier applied for a grant from NIH to extend his quantitative combusion studies to the field of human metabolism, he would have been turned down firmly on Shortcoming 24:

> "It appears that other responsibilities would prevent devotion of sufficient time and attention to this research."

Lavoisier received his income from employment as Commissioner of Internal Revenue—and in the French Revolution this led to his death on the guillotine.

C. W. Scheele, discoverer of chlorine, barium oxide, and oxygen (although the tardiness of his publisher caused his publication on oxygen to be later than Priestley's) might have applied for an NIH grant in 1751 to follow up on his discovery of oxygen, as a therapeutic agent. Scheele, who had no institutional connection and did all his work in the back room of his pharmacy in a Swedish town of about 10,000 inhabitants, would have had his application rejected on Shortcomings 17 and 25:

> "Insufficient training," and "unfavorable institutional setting."

Leopold Auenbrugger, the Viennese physician who invented percussion techniques (tapping) in medical diagnosis did not receive recognition during his lifetime for this important contribution to medical practice. In 1808, the year before his death, and 47 years after the publication of his unpretentious little volume, Corvissant, who was then Napoleon's physician, brought it to the fore. After this endorsement, Auenbrugger's percussion technique received scientific consideration by Skoda, Flint, and others, and became an established method in diagnosis. Had Auenbrugger applied for support from an NIH for the development, completely afield from any diagnostic practice then accepted, he would have been rejected on Shortcoming 2:

> "The proposed research is based on a hypothesis that rests on insufficient evidence, is doubtful, or is unsound."

In 1796 Edward Jenner discovered vaccination for smallpox. He had heard a dairy employee say: "I'm not afraid of smallpox because I've had cowpox." From this lead Jenner proceeded to study the possibility of using cowpox inoculation as a protection from smallpox. He was strongly resisted by the established medical authorities of his day, who would have dominated any study committee. Had Jenner applied for a grant for support of the work that was to lead to control of smallpox, he would have been turned down on Shortcoming 2: (*see Shortcoming above*).

Anthony van Leeuwenhoek, the lens maker who invented the microscope, published imaginative descriptions of what he saw in it. Untaught, knowing no Latin, he was obstinate and persistent. Years passed before he was taken seriously. If he had asked an NIH for support to develop microscopy for better understanding of disease, he certainly would have been turned down on the basis of Shortcoming 19:

"The investigator's previous work does not inspire confidence."

Louis Pasteur, who discovered the nature of alcoholic fermentation and disproved the concept of spontaneous generation of life as a current phenomenon, might well have applied to an NIH for support in more rapidly developing his bacterial vaccines. Being a chemist, without training in medicine or physiology, he would have been disqualified on the basis of Shortcoming 17:

"The investigator does not have adequate experience or training or both for this research."

Robert Koch, the medical practitioner who worked out the methods of isolating bacteria and fully proved their role in diseases, might have applied for support in his classical studies which led to the isolation of the anthrax organism in 1876 and later to discovery of the cause of tuberculosis. Since the theories of C. J. Davaine and of Jacob Henle, on which he based his work, were then far from generally accepted, Koch, in his pre-Berlin years, would almost certainly have been turned down by an NIH Study Committee on the basis of Shortcomings 2 and 25:

"The proposed research is based on a hypothesis which rests on insufficient evidence, is doubtful, or unsound," and "The institutional setting is unfavorable."

Thus the criteria being applied in the NIH, according to Dr. Allen, would have resulted in refusal to support those investigations which we now know were to become milestones of progress in medicine. It has been wisely said that, "for scientific breakthroughs, we must go beyond restraints."

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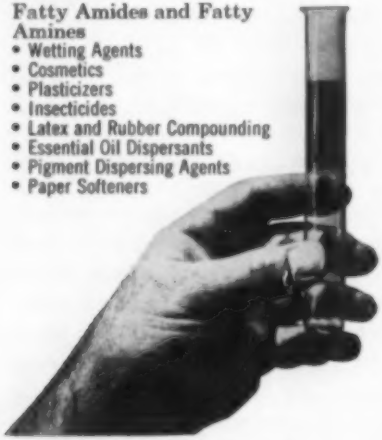

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"Science Projects Handbook" (for young people) 50-cents each. Science Service, Inc., 1719 N. St., N.W., Washington 6, D.C., or from Ballantine Books, Inc., 101 5th Ave., New York 3, N. Y.

"Financial Management in the Federal Government." Prepared by the staff of the Committee on Government Operations, U. S. Senate, Dec. 30, 1960. Query U. S. Government Printing Office, Washington, D.C.

"The Air Pollution Problem — an Appraisal." By W. L. Faith. Final Report of the Air Pollution Foundation, 2556 Mission St., San Marino, Calif.

"The Role of a Professional Society in Program Exchange." Paper presented Oct. 27, 1960 at the Computer Applications Symposium of the Armour Research Foundation, Chicago, by Walter M. Carlson. Query the author at Engineering Department, E. I. du Pont de Nemours & Co., Wilmington 98, Del.

"Annual Report of the Research Division, New York University, College of Engineering, 1960," by Dr. Harold K. Work, F.A.I.C. Query the author at the University, University Heights 53, New York.

"The Science Doctorates of 1958 & 1959. Numbers, Characteristics, and Employment." 25-cents. Superintendent of Documents, U. S. Gov. Ptg. Off., Washington 25, D.C.

"Increasing the Effectiveness of Western Science." Study by the Fondation Universitaire. Send request, with name, profession, and address to Fondation Universitaire, 11, rue d'Egmont, Bruxelles 5, Belgique.

"Funds for Research & Development in Industry 1957." (Published in late 1960). 65-cents. Superintendent of Documents, U. S. Gov. Ptg. Off., Washington 25, D.C.

General Precision Equipment Corp. announces that headquarters have now been established in its new building at 50 Prospect Ave., Tarrytown, N. Y. The New York Office is at 220 E. 42nd St., New York 17.

The Artists' Chemist

THE Artists' Technical Research Institute, Inc., has just been established, assisted by the generosity of Huntington Hartford. It provides scientific information to artists about the technical side of creative painting. Ralph Mayer, F.A.I.C., is its director. He is both chemist and artist. His wife is the well-known artist, Bena Frank Mayer. The headquarters of this new, non-profit Research Institute are at the Mayers' attractive studios above the mews at 240 E. 20th St., New York 3, N. Y.

Ralph Mayer began his career as an industrial paint chemist. For recreation and to indulge a talent, he took up artistic painting. His hobby soon took over his career. He found that the artist relied technically on a shaky foundation of antiquated beliefs and opinions, many without scientific verity. "Even today," he says, "We have developed scarcely any acceptable methods beyond those known to Rembrandt."

He began by coordinating all reliable information on the craft side of the art. In 1940, he published *The Artist's Handbook of Materials and Techniques* (Viking Press), which has been through 14 printings and a revision. It was followed by an introductory textbook, *The Painter's Craft* (D. Van Nostrand). He taught and lectured extensively, and he still teaches "Materials and Techniques of Creative Painting" at Columbia University, the Art Student's League, and the New School. His own paintings have been widely exhibited. He is chairman of the National Bureau of Standards' Committee for Commercial Standards for Artists' Oil Paints.

The announcement of the new Research Institute brought many letters of congratulations from leaders in the art world, with such comments as: "I am fully aware of the desperate need for the type of work you propose to do," and "the contemporary artist has a difficult time when faced with new products for which we yet have no experience."

The scientific research is for the present being carried out by Mr.

Mayer personally in the well-equipped D. H. Litter Laboratories, 116 E. 16th St., New York, N. Y., of which Sidney B. Levinson, F.A.I.C., is director. The Institute plans to expand its present program and also its laboratory staff, and to issue a journal to report research findings.

The Institute does not evaluate trade products, but is interested in such basic problems as crack and fissure formation in paint on canvas, photochemical embrittlement of paint films, paint consistencies, the compatibility of varnishes with artists' paints, color stability. The permanence of artists' paints is a different matter from the permanence of industrial paints, where the term "premature failure" is in use; art is supposed to last forever. Only recently, at a national exhibition, the paint began falling away in flakes from a prize-winning picture. Investigation revealed that the artist had used an incompatible industrial lacquer on his canvas!

The National Lubricating Grease Institute, Kansas City 12, Mo., will hold its 29th Annual Meeting at the Rice Hotel, Houston, Tex., Oct. 29-Nov. 1, 1961.

Texas Eastman Co., a manufacturing division of Eastman Kodak Co., began large-scale commercial production of polypropylene plastic at Longview, Texas, in February. Eastman's plastics production list now covers acetate, butyrate, propionate, polyester, polyethylene, and polypropylene, all marketed under the trade name of "Tenite." The new polypropylene plastic is being made by a continuous process under a relatively low pressure, permitting closer control in the uniformity of the polymer than is possible under batch processes.

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Communications

The Patent System

To the Editor:

P. F. Cassella writes a very interesting article on the Patent System (Feb. 1961 CHEMIST, p. 43), and describes the rewards for invention and authorship in Russia as a distribution of monetary awards combined with recognition of achievement and professional status of the individual and others associated and contributing.

Having gone through the experience of receiving, as a reward for a major invention, both a cut in salary and denial of recognition, one may doubt the benefits of our patent system. In any matter involving patent protection, the first object of the legal arm is to tie up the inventor to an assignment for one dollar and other valuable considerations, which somehow fail to materialize.

The Constitution specifies "securing for limited times to authors and inventors the *exclusive* rights to their respective writings and discoveries." No corporation can invent anything, and originally an employer was entitled to shop rights only. The lawyers know how they managed to get precedents for aggrandisement. Part of their training consists in the appraisal of our patent system, which may be summarized as, "The patent office is the enemy of the inventor and a patent is nothing but a license to a law suit."

A remedy as simple as the statement in the Constitution is possible, but I fear that the self-interest of the legal profession will not allow it.

—Dr. John A. Steffens, F.A.I.C.
Suffern, N. Y.

Our New Look

To the Editor:

Congratulations to you and the staff and to Richard L. Moore and the members of the Public Relations Committee for the new style of cover on the current issues of THE CHEMIST. In contrast with the covers of the previous four years, I notice that the new format is both bold and functional. I like it.

—Harlan J. Anderson, M.A.I.C.
Kennewick, Washington

To the Editor:

I received the first issue of THE CHEMIST with a new cover. It is very striking and I think it has added a bit of character. May I make a suggestion? I notice in certain light the "C" of CHEMIST does not show up very well. Perhaps a thin outline of black at the outer edges of the "C" will give it a bolder appearance. Try this and see if it improves the appearance of what is now a very striking front page.

—Ralph Lamenzo, F.A.I.C.
Guayaquil, Ecuador

To the Editor:

The new look of THE CHEMIST is most attractive. I am glad that you have retained the two-column format in many places. In general it is easier

reading for me. However, it is my guess that you would find that just as many prefer the broad column as do the double column. I have one comment on the cover that might bear exploring. I had to look twice to make sure that it really was the CHEMIST . . . Even when I knew the "C" was there in white paper sans ink, I had difficulty recognizing it as a "C."

—Bernard E. Schaar, Hon. AIC
Chicago, Ill.

To the Editor:

Congratulations on what might be called the evolution of the cover of THE CHEMIST, although I must say that the cover used for so many years was quite satisfactory . . . No doubt you have received many comments and I am hoping that on the basis of these you will ultimately decide to return to the use of the old cover design . . .

No doubt we have a few academic deans in our membership. Have you heard this definition? A Dean is a man who has a faculty for getting his work done!

—Dr. Jack P. Montgomery, Hon. AIC
Tuscaloosa, Ala.

To the Editor:

Congratulations on the new face and new format of THE CHEMIST. Richard L. Moore and his Committee on Public Relations and the P. R. Department of W. R. Grace & Co., deserve a hearty vote of thanks for their contribution.

—Dr. Bernard S. Friedman, F.A.I.C.
Harvey, Illinois

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Professional Appointments

May 3, 1961. Richmond, Virginia. Reynolds Aluminum Co. Auditorium. Meeting of Virginia Chapter. Presentation of Charter to the new Chapter by AIC President, Dr. Milton Harris. Panel discussion, led by Dr. Harris, on "The Chemists' Stake in our Modern Society." For information: Robert Anderson, Secretary of the Chapter, 104 La Salle Drive, Richmond, Va.

May 4, 1961. Valley Forge, Pa. Tally-Ho Hotel-Motel, Route 202. Meeting of Philadelphia Chapter. Dinner 6:30 p.m. Annual Student Award night. Outstanding senior students in chemistry and chemical engineering in colleges and universities in Philadelphia area will receive awards. Presentation: 8 p.m. Lecture 8:30 p.m. Speaker, Dr. Arthur Osol, F.A.I.C., Philadelphia College of Pharmacy & Science, Philadelphia, Pa. Subject: "Education for Excellence—a Price of Freedom." Deadline for reservations, April 28, 1961. Contact: Dr. C. K. Deischer, Univ. of Pennsylvania, Philadelphia, Pa. EVergreen 6-0100, Ext. 8317.

May 6, 1961. Hollywood, Florida. Meeting of Florida Chapter. For information, Robert A. Nanz, Secretary of the Chapter, Florida Chemists & Engineers, Inc., 645 Rugby Ave., Orlando, Fla.

May 10, 1961. Washington, D.C. Statler-Hilton Hotel. The AIC President's Reception to the National Council, Members of the Annual Meeting Committees, and their wives. 5:30 p.m.

May 10, 1961. Washington, D.C. Statler Hotel. Dinner Meeting of the AIC National Council, Board of Directors, and 38th Annual Meeting Committees.

May 11, 1961. Washington, D.C. Statler Hotel. Breakfast meeting of the Committees on Membership and on New Chapters and Expansion. Others interested are welcome. For information: Dr. L. T. Eby, 1105 DeWitt Terrace, Linden, N. J., or Martin B. Williams, 1013 Pratt Ave., N.E., Huntsville, Ala.

May 11-12, 1961. Washington, D.C. Statler-Hilton Hotel. The 38th Annual AIC Meeting. "The Key to Valuable Information." See April issue of THE CHEMIST for Program. The Washington AIC Chapter will be our host.

May 12, 1961. Washington, D.C. Statler Hotel. Annual AIC Business Meeting 2:00 p.m. Reports of Officers, Chapters, Committees. Old and New Business. Announcement of Election of Officers.

May 12, 1961. Minneapolis, Minn. (Place to be announced) Meeting of Twin City Chapter. Presentation of student medals. For information: Dr. H. L. Weisbecker, 2138 Berkeley Ave., St. Paul, Minn.

May 17, 1961. Chicago, Ill. Beaubien Room. Meeting of Chicago Chapter. Speaker, Dr. Gerald Gordon, E. I. du-Pont de Nemours & Co. For information: Chicago Chapter Secretary, Miss Helen Selin, 6916 N. Wayne Ave., Chicago 26, Ill.

May 25, 1961. New York, N. Y. Shelburne Hotel, 38th St. & Lexington Ave., Meeting of New York Chapter. Presentation of Honor Scrolls to Samuel Schenberg, Director of Science, Board of Education, City of N. Y., and to Dr. Alvan H. Tenney, Manager, Market Research Dept., Union Carbide Chemicals Co., for their work in furthering science education in the N. Y. city schools. For reservations, Dr. K. S. Konigsbacher, Evans Research & Development Corp., 250 E. 43rd St., New York 17, N. Y. (MU 3-0071).

May (latter part) **or June 1961** (early). **New Orleans, La.** Student Medal Award Meeting of the Louisiana Chapter. For information, Mack F. Stansbury, Chapter Chairman, Southern Utilization R & D Div., 1100 Robert E. Lee Blvd., New Orleans 19, La.

May 31, 1961. Los Angeles, California. Roger Young Auditorium, 936 West Washington Blvd. Meeting of Western Chapter. Social hour, 6:30 p.m. Dinner 7:00 p.m. Annual Student Awards. Subject of talk, "Professional Status and Relations of the Chemist." For information, Stuart R. Garnett, Chapter Chairman, Blue Diamond Co., 1650 S. Alameda St., Los Angeles 54, Calif.

June 6, 1961. Niagara Falls, N. Y. Meeting of Niagara Chapter. Student medals will be presented. Place, subject and speaker to be announced. For information, Prof. Howard W. Post, Chapter Secretary, Chemistry Depart-

ment, University of Buffalo, Buffalo 14, N. Y.

June 21, 1961. Chicago, Ill. Beaubien Room. Meeting of Chicago Chapter. Speaker, Dr. A. Allan Bates, Portland Cement Association. For information: Miss Helen Selin, Chapter Secretary, 6916 N. Wayne Ave., Chicago 26, Ill.

May 10-11, 1962. Chicago, Ill. Edgewater Beach Hotel. The 39th AIC Annual Meeting. The Chicago AIC Chapter will be our host.

Twin City Chapter Presents Honor Scroll

The first Honor Scroll of the Twin City AIC Chapter was presented to Victor Cohn, science writer, *Minneapolis Tribune*, at a meeting held Jan. 31, 1961, at the Minneapolis Athletic Club, Minneapolis, Minn.

Dr. H. L. Weisbecker, chairman of the Chapter, introduced A. C. Holler, chairman of the Honor Scroll Award Committee, who presided over the meeting.

Daryle Feldmeir, managing editor of the *Minneapolis Tribune*, spoke on "The New Egghead" and introduced Victor Cohn. Morris Kenigsberg, representing the Minnesota Section of the American Chemical Society, congratulated the Twin City Chapter for its selection of Mr. Cohn as the recipient of its first Honor Scroll.

Dr. Milton Harris, AIC president, presented the Honor Scroll to Victor Cohn, who responded with an address on "The Exciting World of Tomorrow." (See this issue of THE CHEMIST for these talks.)

The inscription on the Honor Scroll reads:

To Victor Cohn

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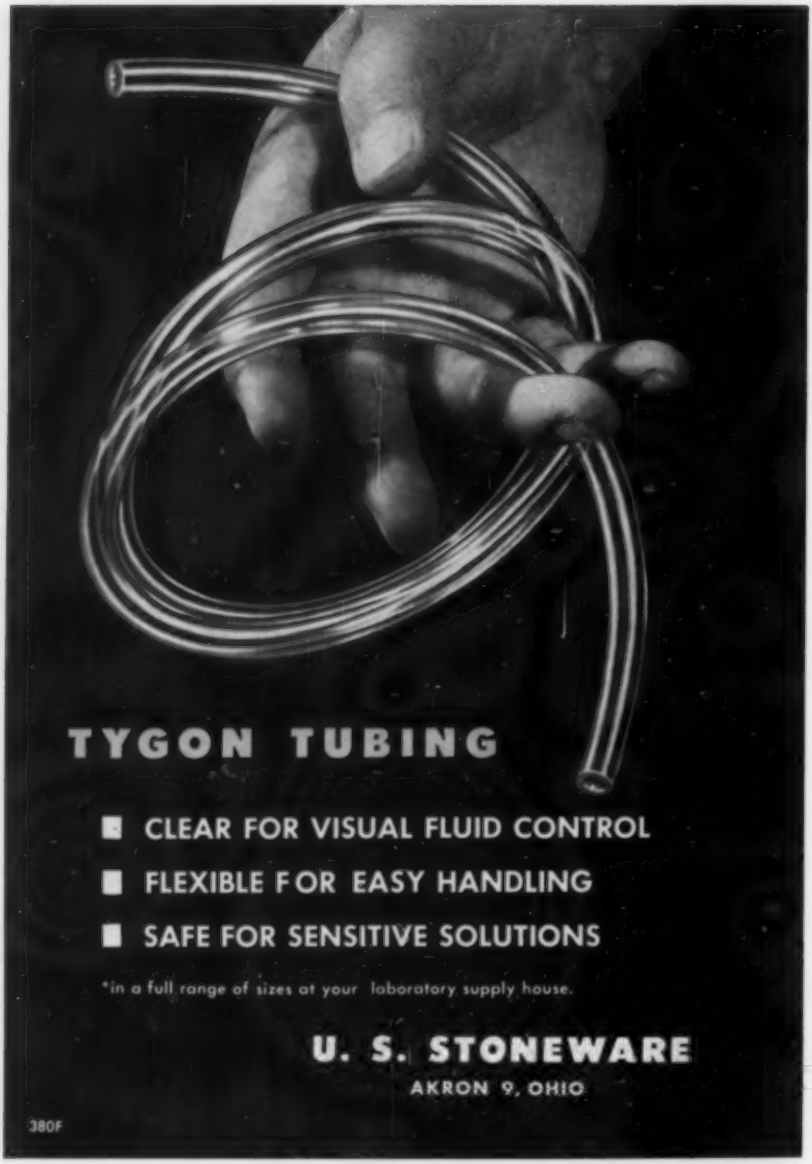
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